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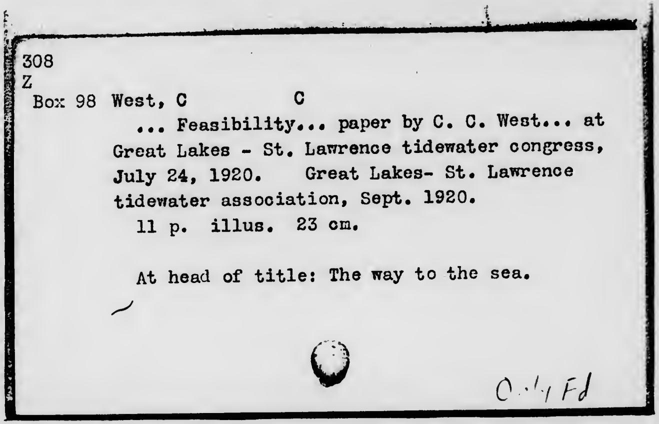

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The Way to the Sea

FEASIBILITY

*"Eighty per cent of the present
ocean going merchant fleet
will at once have access to
lake ports when the Great
Lakes are open to the sea by
the St. Lawrence."*

Paper by C. C. West of Manitowoc
at Great Lakes-St. Lawrence Tidewater Congress, July 24th, 1920.

OPEN THE LOCKS

GREAT LAKES - ST. LAWRENCE TIDEWATER ASSOCIATION

Sept. 1920

FEASIBILITY

Eighty per cent of the present ocean-going fleet can reach the upper lakes by present channels when the way is open through the St. Lawrence and the new Welland.

More than eighty-six per cent can reach Lake Erie by the same improvements.

Three-fourths of the vessels passing through Panama and through the Suez, on world trade routes, are no larger than these channels will accommodate.

Abundant evidence that this is a practical traffic route, as soon as the physical improvements are made, was put in the record in the recent hearings before the International Joint Commission by naval architects, vesselmen, and traffic experts.

Edward Hopkins, naval architect and builder, Toledo:—Assuming that the St. Lawrence channels are enlarged to a 20 foot draft, ocean-going vessels would come right into the lakes. A four thousand ton steamer, built on the ordinary lines, would run somewhere from eighteen to twenty foot draft.

L. G. Macomber, traffic expert, Toledo:—Even if it were impossible to navigate Lake Huron and Lake Michigan, still there is reason for opening the St. Lawrence route because we have the seaports and the ability to serve the country from the Lake Erie Ports.

A. M. McDougall, vessel builder, Duluth:—After considering what has happened on the Great Lakes during the last twenty years, you will be convinced that if 80% of the ships now available do not make use of the water route, the Great Lakes of their own accord will develop a type and size of ship that will be suitable for navigation not only on the lakes but on the sea.

David Stocking, president, The Tomlinson Company, vessel owners and operators, Duluth:—Let lake transportation take the grain as far down the St. Lawrence as it can and meet the ocean tonnage, or let the ocean tonnage come to the head of the lakes. What we want is economical, cheap transportation—an outlet. . . . The competition between the ocean steamer and the lake vessel with transfer would be governed by market conditions, including the return load factor.

These are four typical statements of a large number in similar terms presented in the course of the hearings.

Feb 5, 1923
HE

FEASIBILITY

The Ocean Fleet in the Great Lakes

By C. C. WEST

The proposed deep water route from the Great Lakes to the Atlantic Ocean has aroused much public interest and at the same time has caused much discussion regarding the size and type of ship which can be used. There have been many conflicting statements made, and opponents of the project have made many erroneous ones, and there is a very general misconception regarding the nature of cargo which the ocean carrier will handle when the waterway is opened.

It has been frequently stated by opponents of the waterway that—

1st—Ocean ships could not be used on the Great Lakes, even if the waterway were opened.

2nd—That the ocean ship would interfere with the lake ship.

The fact is, and it can be shown definitely and conclusively, that providing there are goods to be transported between the Great Lakes and foreign ports, or even the Great Lakes and Atlantic ports, the regulation ocean tramp ship can do this work successfully.

The lake ship has a field of its own on the Great Lakes in which the ocean ship could not compete, but the ocean ship would also have its field in carrying cargo for which the lake ship is not adapted.

Testifying before the International Commission, one gentleman stated that an 8000 ton ocean ship required from 30 to 35 feet of water in which to navigate and attempted to show that the comparatively shallow lakes could not be navigated by ocean carriers. Let us now see what this contention amounts to.

RESTRICTIONS TO LAKE NAVIGATION

Assuming that the work of the Welland and St. Lawrence Canals has been done, it is now our purpose to inquire into obstacles and restrictions to navigation on the rest of the Great Lakes.

We find on careful investigation that draft restrictions are limited principally to the Livingston Channel below Detroit, which has at present a depth of about 21 feet at low water, and the canal channels at Sault Ste. Marie, which have a depth of about 21 feet. We also practically find that the large ports on the Great Lakes at present will accommodate ships drawing 21 feet, and even the smaller ports could arrange for a 21 foot draft at comparatively slight expense.

Let us now examine into the draft required by ocean steamers which can economically carry cargo from one port to another.

DRAFT—THE LIMITING FEATURE

In the modern deep sea cargo ship the draft bears a definite ratio within certain limits to the length, breadth and depth of the ship, and therefore, determines the carrying capacity of a ship.

The following table represents, I believe, the average sizes and drafts of ocean ships, although there is a certain variation usually dependent on the type of the ship:

RELATIVE SIZES AND CAPACITIES OF CARGO CARRIERS

Deadweight Carrying Capacity	Length Keel	Beam	Load Draft	Speed Loaded
1,000 tons	185—0	29—0	13—0	10
2,000 tons	227—0	32—6	17—0	10
2,500 tons	250—0	35—0	18—0	10
3,000 tons	250—0	43—6	20—0	10
4,000 tons	304—0	46—9	20—0	10
4,500 tons	334—0	48—0	21—0	10
5,690 tons	350—0	49—0	21—9½	10
8,200 tons	400—0	54—0	24—0	10
8,800 tons	423—0	54—0	24—1	11
10,000 tons	450—0	59—0	26—2	10
14,000 tons	500—0	64—0	28—5	10

You will note that quite large ships can operate on 22 or 23 feet of water, and I will show later that it is entirely possible to use these ships on the lakes if the volume of business requires it.

The limiting depth of 21 feet which would confront us at the opening of the proposed new St. Lawrence and Welland Canal locks, therefore, seems to restrict the size of fully loaded ocean ships of conventional design to about 5,500 to 6,000 tons deadweight.

That, however, is a very profitable and popular size of which large numbers have been built and are now being built. The "Dromania," (illustration No. 3), is a brand new ship of the Colonial British Merchant Marine, built in Australia. It is not only a modern type, but a popular size and carries cargo economically in general high seas trade.

You are no doubt aware of the fact that there are hundreds of trade routes between different ports and different countries and certain line routes require special ships. The large ships of 9,000 to 12,000 tons deadweight are built to trade on line runs between large deep water ports, but the bulk of the oversea traffic is carried on in medium sized " tramp" ships. These "tramp" ships, as the name implies, will go anywhere that an attractive cargo is offered, loading and discharging cargo at each port touched.

The present tendency in shipbuilding is to increase the beam of ships in proportion to their length, thus decreasing the draft, and one of the attractive features in a "tramp" ship is the carrying of its load on as limited a draft as possible, thus enabling it to load and discharge cargo in small as well as large harbors. The "Risvaer," (illustration No. 7), is a capable boat carrying more than 3,000 tons in less than 18 feet.

MEDIUM CARGOES PROFITABLE

It may be of interest to point out that the English merchant marine, which is operated by the most expert ship operators in the world today, does not incline to the large ship except for certain routes, the medium size "tramp" steamer is still the favorite. British experts have recently decided that for all around world trade the most profitable ship is a slow speed (9 to 9½ knots) standard cargo ship about 390 feet in length carrying about 6,600 tons deadweight, (illustration No. 14). Leading authorities agree that a 350 foot ship carrying its total deadweight load of 5,896 tons on 21 foot 9 inch draft is one of the most profitable sizes and completely justifies the continued building of this size for ocean trade. (No. 3).

The statement, that even if the canal were built there would be no ships available in the Great Lakes-High Seas traffic is usually based on some vague belief that an ocean ship is a peculiar animal that requires salt water, or that the Great Lakes are a string of shallow ponds.

An ocean "tramp" ship will go anywhere that attractive cargo offers and where drafts or loading conditions will permit. They steam hundreds of miles up the Amazon, they go via canal to Manchester, almost to the heart of England, they use Rouen as a terminal, they will use the Great Lakes for precisely the same reason.

TONNAGE AVAILABLE

Let us now inquire into the available ocean tonnage if the St. Lawrence were deepened. One read of gigantic "Leviathans" and Aquitanias," ships that are actually marvels as floating hotels, which, due to publicity are accepted by the reading public as commonplace. The "tramp" steamers or ocean freight carriers are seldom accorded the prominence which is their just due. It will come as a surprise to many that of the great fleet of ships on the high seas, about 60% are less than 5,000 tons and 86% of the total number are less than 7,000 tons deadweight. Ships of this type prevail.

This means that there is immediately available for service upon the Great Lakes and the high seas on the opening of the St. Lawrence, a great fleet of vessels totaling some thirty-six million (36,000,000) deadweight tons. Dependent on the sizes and amount of cargoes offered will be the size and type of ships. Probably at first the smaller ships will be attractive.

The actual tonnage of vessels thus available is shown in the following table which also clearly shows the predominance of the small and medium size ship:

SHOWING LLOYDS FIGURES

	Less than 1,500 DWT.	Above 1,500 DWT. and under 3,000 DWT.	Above 3,000 DWT. and under 7,000 DWT.	Above 7,000 DWT. and under 15,000 DWT.	Above 15,000 DWT.
No. of Ships	12,501	3,251	5,250	3,126	238
D.W. Tons	6,563,340	6,401,400	23,951,000	27,288,000	5,303,000

This shows clearly that the large ship is the exception and the small and medium size ship is the rule.

It is a matter of common knowledge, that while the tendency of marine construction is toward the building of larger and larger ships, these are usually for special trades between very large cargo assembling ports where the entire cargo is loaded at one time. It is also believed by many that the construction of large tramp ships has been overdone.

When large cargoes can be quickly assembled at one port, the large ship is undoubtedly the most efficient; but it is also evident that it is far easier to assemble a medium sized cargo than a large one and it is probable that for a long time the ocean carrier of the size and type of the SS. "Hilton" will be most used. (Illustration No. 11).

One of the most successful American ship operators has on this theory over a long term of years stuck to the ships of the size which are consistent money makers.

ECONOMY IN FUEL LOAD

I desire to call your attention to the fact that the term, "deadweight carrying capacity" of an ocean ship, means the combined weight of the cargo, the fuel and the fresh water which is carried. In a coal burning ship of 5,500 tons the actual cargo carried would be about 4,600 tons, while the combined weight of the coal and fresh water would be approximately 875 tons. In view of the short distance between lake ports and Montreal, a 6,000 or even a 7,000 ton ship would load to the maximum allowable draft, carrying only a small proportion of its fuel, and practically no fresh water, and would take on fuel and fresh water at Montreal for the large part of the voyage.

It is, therefore, evident that if a 5,500 ton ship could carry its entire fuel and freight on a 21 foot draft, that a ship of between 6,000 and 7,000 tons deadweight carrying capacity could (enroute to the sea) load its entire profitable cargo at lake ports of 21 foot draft and take on the bulk of its fuel and fresh water at Montreal en route to the sea.

Even a standard 8,800 ton ship, of which there were large numbers built in this country during the war, could profitably engage in the Great Lakes high seas trade.

I desire to call your attention, however, to the fact that while a steamer has somewhat more draft in fresh than in salt water, which decreases the net cargo which can be carried on the lake, this is compensated for by not having to carry any fresh water while on the lakes.

8,800 TON SHIP—ROBT. DOLLAR TYPE

Cargo	7,070 tons
Fuel	1,530 tons
Water	200 tons
	8,800 tons

Draft—Full cargo, fuel and water, 24′ 2″.
Draft—Full cargo and 300 tons fuel, 21′ 8″.

The above table gives us a distribution of the items comprising the deadweight of a ship which is fueled for a long voyage. If this ship came to the lake it is evident it could take on almost a full cargo.

In the most modern type of freight carriers, the motorship, which is rapidly coming to the front as a carrier of cargo owing to its great fuel economy and its tremendous steaming radius without re-fueling, as well as to the weight and space-saving character of its machinery, the saving in weight due to the type of its machinery, and small amount of space necessary, makes this ship a tremendous carrier on a limited draft.

GENERAL DESIGN OF OCEAN SHIPS

It will be seen that in ocean ships the engines are generally placed amidship and the cargo is generally carried forward and abaft of the engine space. This feature contributes to better seaworthiness when light or partially loaded. This cargo is generally handled by means of cargo handling gear carried by the ship itself. Booms and winches are arranged to lift the cargo from the ship's hold and swing it over the side to be lowered either on a wharf or on the deck of a lighter moored alongside. The loading is merely a reversal of this procedure.

Often these ships are loaded and unloaded while at anchor in a harbor by the use of lighters alongside. In some cases special loading apparatus is used, generally in the form of a conveyor or similar apparatus which is designed for the handling of packages of a uniform size. Where special freight is handled and the pieces are difficult to handle, a combination of the two is often used.

THE COMPOSITE CARGO

The conventional cargo carrying ocean ship trades between ports usually having no facilities at the docks for either loading or unloading and carries a miscellaneous freight of widely divergent character consigned in many cases to a number of different ports. This generally necessitates the use of one or more decks on which to stow freight.

You will recall that the Livingston Canal below Detroit and the Sault Ste. Marie channel were the two obstacles which limit lake navigation to 21 foot draft. Livingston channel is above Toledo and from Toledo to Lake Ontario we have a 23 foot to 24 foot draft available.

In lakes-to-ocean commerce, therefore, a 7,000 to 8,000 ton ship could take on a large part of its cargo at upper lake ports, such as Chicago, Milwaukee or Duluth or Detroit, loading down to 21 feet, and then take on the balance at lower ports, such as Toledo, Cleveland, Buffalo or Montreal. This is common practice in ocean cargo ship operation.

FULL LOAD OF LIGHT WEIGHT

Ocean cargoes, however, are now largely calculated on a basis of cubic measurement in which the shipper pays for the space occupied instead of the actual weight. Many cargoes are so bulky that the ship carries a full load on less than its allowed draft. Therefore when the St. Lawrence is opened this is another reason why we will see ships of 5,000, 6,000 or even 8,000 deadweight tons at once put into the service.

NEW YORK USES ALL SIZES

It is also of interest to show the sizes of ships allocated by the United States Shipping Board to different trade routes:

New York to Argentine	5,000 to 9,000	tons deadweight
Boston to Argentine	4,200 to 9,000	tons deadweight
Mobile to Argentine	5,075 to 6,200	tons deadweight
New Orleans to Argentine	5,075	tons deadweight
Wilmington, N.C. to Argentine	7,500 to 9,000	tons deadweight
New York to Brazil	5,075	tons deadweight
New York to Rio Janiero	5,075 to 8,650	tons deadweight
New Orleans to Rio & Santos	5,075	tons deadweight
New York to Valparaiso	5,075 to 6,982	tons deadweight
New York to Egypt	4,300 to 5,075	tons deadweight
New York to Bombay	7,500	tons deadweight
New York to Danzig	5,000	tons deadweight
New York to Constantinople	7,300 to 9,000	tons deadweight
New York to West Africa	6,200 to 8,000	tons deadweight
New York to South Africa	6,100 to 7,500	tons deadweight
New York to China	7,500 to 9,600	tons deadweight

Even a casual glance at this table will demonstrate that a large part of these same ships could make their appearance in lake ports. If a 5,000 ton ship can operate from New York to Egypt, it ought to be able to be used between Chicago and Liverpool.

THE LAKE FREIGHTERS

In contrast to the deep sea ship, I now desire to call attention to the modern cargo carrier of the Great Lakes. This type of ship (illustration No. 12) constitutes at least 85% of the cargo carrying fleet of the Great Lakes and is a type which has been developed after years of experience with a view to maximum economy in the loading, carrying and discharging of cargo. The low cost loading and discharging is obtained by means of special machinery at the loading and unloading docks and the ship's structure is so designed as to permit of this machinery being used.

A ship of this type can be loaded with a full cargo of ore in about three or four hours with no labor necessary for trimming cargo, as every portion of the hold is reached by the loading spouts.

In the loading of coal under the modern car dumper, this labor-saving feature is also evident. In the loading of grain this advantage is not so pronounced, as grain is a flowing cargo and easily trimmed.

In the unloading of a lake ship the opening of the hatches gives us a practically open boat from which the entire cargo can be unloaded without hand labor. In the handling of coal the situation is the same and an ocean ship under a modern lake port unloading apparatus would be hopelessly outclassed.

In striking contrast to the ocean ship, the typical lake freighter has gained attenuated proportions, simply as a result of trade development and local conditions. Traffic conditions on the Great Lakes have compelled designers to produce a ship of tremendous length in proportion to its breadth and depth. This vessel is able to navigate our inland lakes as it is not subject to the severe storms which prevail at times on the ocean. Our lake ships have also relatively small power in proportion to the deadweight cargo carried.

WHAT GREAT LAKES FREIGHTERS TRANSPORT

The great bulk of the cargo carried by Great Lakes steamers is shown by the approximate figures for 1918:

Iron ore	61,156,732 tons
Coal	32,102,022 tons
Grain	4,500,000 tons
Miscellaneous (approximately)	1,000,000 tons

The actual tonnage will be seen to run to a vast amount. The movement of these cargoes in general is as follows: The iron ores are shipped from points on Lake Superior and Lake Michigan to such ports as Cleveland, Buffalo, Dunkirk, Ashtabula, Toledo and Chicago.

Return cargoes consist of coal, which is carried from Lake Erie ports to Lake Superior and Lake Michigan ports. The peculiar nature of this business, as before stated, has resulted in the development of special loading and unloading apparatus for each sort of commodity and the size and character of this loading and unloading apparatus have largely affected the designs of the ships and resulted in a long, shallow, narrow ship with numerous large hatches, closely spaced.

WHAT THE OCEAN SHIP WOULD CARRY

In view of the fact that practically none of the coal or ore which constitutes the great bulk of the tonnage at present transported in lake ships is shipped either to the Atlantic Coast or to foreign ports, the ocean ship would have no chance in this field, and its great value would be in the transportation of food stuffs and manufactured commodities originating in territory contiguous to the Great Lakes district, and in bringing in goods for consumption in the middle west. The Hon. A. P. Nelson shows that in the year 1918, about $364,000,000 worth of dairy products, meat packing products and manufactured goods were produced in the great group of interior states tributary to the Great Lakes, and that this group of states produced from one-half to seven-eighths of the principal staples and provided a surplus of wheat, meat, dairy products and leading minerals. It is just this sort of product, therefore, that will be shipped by steamer through the new St. Lawrence waterway, and it is practically this kind of product that could not be shipped in the present lake steamer, but would require the standard established sea carrier which is designed to handle miscellaneous cargo.

WHY THE OCEAN SHIP WILL NOT CONFLICT

There has been expressed at different times by the owners of lake ships, the fear that if the St. Lawrence waterway were opened the ocean ships would be attracted by the freight business now done by the ocean carriers. One has only to examine into the operating costs of the two types of vessels to realize how ridiculous this fear is. The cost of transporting freight on a vessel, per deadweight ton, is dependent on three things:

1. The cost of the vessel per deadweight ton.
2. The operating expense of the vessel at sea per deadweight ton.
3. The operating expense of a vessel while in port and the unloading or loading, per deadweight ton.

In competition between lake and ocean steamers in the carrying of bulk cargo such as ore, coal and grain, the ocean ship would immediately be confronted with the facts:

1. That its first cost is at twice that per deadweight ton of the lake ship.
2. That its operating expense averages fully 20 per cent more per deadweight ton, and
3. Its operating expense in loading and unloading cargo would be at least 300% per deadweight ton more than that of the lake ship.
4. Its time in port many times that of the lake ship.

Therefore, for the transportation of coal and ore the ocean carrier would be absolutely useless, while in the transportation of grain the logical effect of the canal would be to permit the lake freighter to transport its grain cargo to Montreal (farther than it does at present) at which point it would be transferred to the large ocean carrier. It is, therefore, easily seen that the lake fleet would not be interfered with in its present business, and that the ocean ship would come to the Great Lakes and would leave the Great Lakes laden with miscellaneous manufactured products which are now carried almost entirely by the railroads. As a matter of fact the field of usefulness of the lake ship would be greatly increased.

WHY THE LAKE SHIP WOULD BE USELESS TO THE OCEAN

Even a casual glance at a lake ship shows that with its very small power such a ship could not stand the storms prevalent on the high seas and also it has no means for loading or unloading a miscellaneous cargo. It, therefore, could not carry miscellaneous cargo.

Further, the lake ship has no between-decks in its hold, while the ocean carrier generally is divided horizontally in order to facilitate the handling and stowing of miscellaneous cargo.

COST OF TRANSPORTATION IN OCEAN SHIPS

In order to show that goods can actually be transported on the Great Lakes in ocean ships in a successful way from a commercial standpoint, I have calculated the detail cost of transportation of freight in a 5,500 ton freighter on a voyage from Chicago to Liverpool and return.

Voyage Calculation—Package Freight

5,500 D.W. Ton Freighter—Chicago to Liverpool and return.
Voyage 7,900 miles—54 days, turn around.
Value of ship, $825,000. Lay-up 30 days per year.

Fixed Charges (including proportion lay-up time):			
Insurance 6%		$ 7,960	
Port dues and pilotage		4,500	
Bond interest ½ value, 6%		4,000	
Depreciation 5% on value		6,650	
Sinking fund 9% on value		12,100	
Interest on capital stock, ½ value, 7%		4,165	
Interest on working capital		300	
			$39,675
Operating Expenses:			
Maintenance at 65c per D.W ton per month		$ 7,500	
Loss and damage		600	
Fuel oil at $10—775 tons		7,750	
Water		150	
			16,000
Crew Wage and Subsistence:			
Deck crew	9	$ 2,575	
Engine	13	3,180	
Stewards	9	1,380	
Subsistence	31	at 90c per day per man 1,640	
			8,775
Stores:			
Deck		$ 675	
Engine		770	
Stewards		562	
			2,007
Cargo handling			5,750
			$72,207

Rate per ton cargo carried, cargo return light	$15.60
Rate per ton cargo carried, cargo return ½ load	10.92
Rate per ton cargo carried, cargo return full load	8.46

Itinerary—

Chicago	8 days
Enroute Liverpool	19 days
Liverpool	8 days
Enroute Chicago	19 days
	54

Deadweight List—

Cargo	4,600
Bunkers	775
Water	100
Stores	25

This schedule is prepared from an actual voyage of the same length on a similar ship operating out of New York. The net result shows that this ship could at a good profit on the capital invested, carry a ton of freight from Chicago to Liverpool and return light, for the sum of $15.60. If the ship were able to obtain a one-half cargo of imported goods from Liverpool to Chicago, the average cost would be, approximately $10.92, and if full cargo were obtained both ways, the cost would be $8.46. The above schedule, as before stated, includes a fair profit to the owner for the investment in his ship, as well as a proper amount set aside for depreciation and sinking fund for growth of business. The cost per deadweight ton of this ship is based on the present average market price and if the cost of ship construction should be reduced, the cost of freight transportation would be likewise reduced.

CONCLUSION

I have endeavored in the foregoing paper to show:

1. That it is not only possible but entirely feasible to operate ships from the Great Lakes to the Ocean.

2. That the ocean ship cannot and will not interfere with the operation of the Great Lakes fleet.

3. That the field of operation for the Great Lakes fleet will itself be greatly enlarged, as Great Lakes vessels will be able to transport their cargoes of grain and coal to Montreal and other St. Lawrence ports; and,

4. That there is immediately available for the transportation of package freight and miscellaneous manufactured goods, a great fleet of ocean ships which are of the size and type exactly fitted to do that business.

5. That the 4,000 to 5,500 ton deadweight slow speed ship is really the most reliable investment for steady earnings and that goods are being carried profitably in that class.

6. That ships as large as 8,800 tons can be used successfully at once in the Lakes trade.

In conclusion, I most emphatically repeat that you may absolutely put your mind at rest on the question of ships.

Open the St. Lawrence as proposed and arrange the proper terminal facilities. There is an abundance of available and suitable ships to do business.

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VESSEL TYPES

EIGHTY PER CENT OF THE WORLD'S MERCHANT FLEET CAN ENTER THE GREAT LAKES WHEN THEY CAN PASS THE ST. LAWRENCE RAPIDS

Illustrating a paper by C. C. West of the Manitowoc Shipbuilding Company before the Great Lakes-St. Lawrence Tidewater Congress—Detroit, July 23, 1920

Six thousand tons on 21 feet—she could make the lake trip.

The lake freighter—she carries a whale of a cargo but she can't go out to sea.

PUBLISHED BY THE GREAT LAKES-ST. LAWRENCE TIDEWATER ASSOCIATION

Chas. P. Craig, *Executive Director*

DULUTH, SEPTEMBER 1920

INTENTIONAL SECOND EXPOSURE

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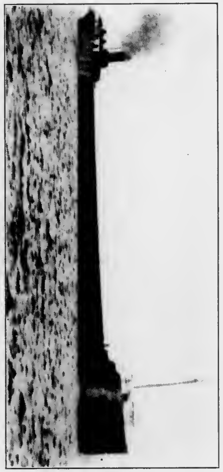
VESSEL TYPES

EIGHTY PER CENT OF THE WORLD'S MERCHANT FLEET CAN ENTER THE GREAT LAKES WHEN THEY CAN PASS THE ST. LAWRENCE RAPIDS

Illustrating a paper by C. C. West of the Manitowoc Shipbuilding Company before the Great Lakes-St. Lawrence Tidewater Congress, Detroit, July 23, 1920



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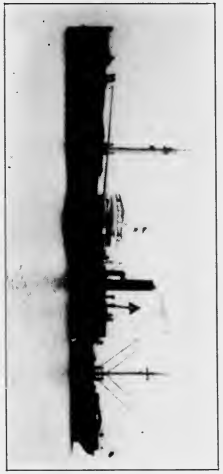

Six thousand tons on 21 feet—she could make the lake trip.

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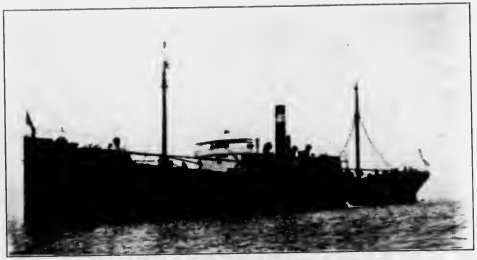
Nearly 5,000 tons on 20 feet, the "Hilton" would be at home on lakes and ocean.

Of course she won't cross the ocean. She was built exclusively for lake service.

Adapted perfectly to general cargo service at sea—and she draws less than 20 feet.

86 per cent of the ocean fleet are no larger than the "Pedro." She would make Lake Erie.



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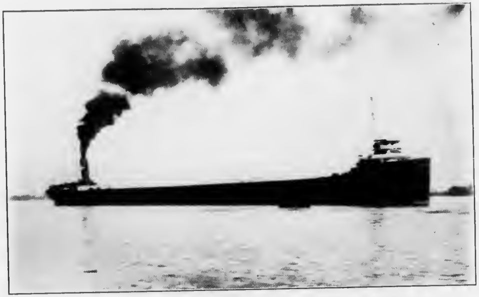

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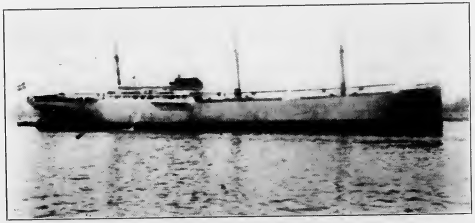

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